

## INDUSTRY OVERVIEW

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### SOURCE OF INFORMATION

We have commissioned Frost & Sullivan to conduct market research and analysis of selected industries and prepare a report entitled *Global Camcorder Independent Market Research*, dated April 2015. The market research was completed in April 2015. Frost & Sullivan is an independent global consulting firm founded in 1961 in New York. It offers industry research and market strategies and provides growth consulting and corporate training.

In preparing the report described above, Frost & Sullivan conducted detailed primary research which involved discussions of the status of the selected industries with certain leading industry participants. Frost & Sullivan also conducted secondary research which involved reviewing company reports, independent research reports and data based on its own research database.

Frost & Sullivan obtained the figures for various market size estimates from historical data analysis plotted against macroeconomic data, as well as considered the industry key drivers discussed in the report. Its forecasting methodology integrates several forecasting techniques with its internal analysis of critical market elements investigated in connection with its market research work. These elements include expert-opinion forecasting methodology, integration of market drivers and restraints, integration with the market challenges, integration of market trends, and integration of econometric variables.

We were charged RMB0.8 million by Frost & Sullivan in connection with its preparation of the report. Our payment of such fee is not contingent upon the results of its research and analysis.

### THE GLOBAL DIGITAL CAMERA AND CAMCORDER MARKET

#### Overview

A digital camcorder is an electronic device that combines a photo camera and a video recorder into one unit. Digital camcorders are generally classified into traditional camcorders, which are fixed video cameras typically used for television broadcasting and similar purposes, and PoV camcorders, which are portable camcorders typically used for personal recording by individuals. PoV camcorders are portable and offer a different user experience compared with stable shooting by traditional camcorders. PoV camcorders are further divided into the following types:

- *General camcorders*: for home videos and other household use;
- *Action cameras*: for action shots especially during sports activities, such as surfing and rock climbing; and
- *Special camcorders*: for more professional or special conditions, such as aerial shots.

Since 2010, the global digital camcorder industry has been in decline as the video recording capabilities of smartphones and tablets have increasingly supplanted traditional recording devices. However, the recent introduction of action cameras and other professional,

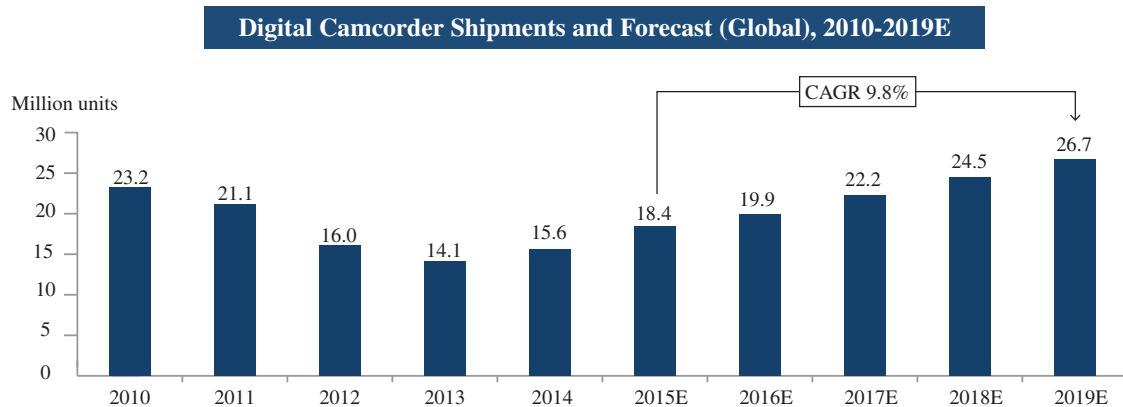
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niche camcorders have provided a new driver for growth. The introduction of action cameras marked a change in user behaviour and created a new product demand by providing a capture device specially made for action videos. Unlike general camcorders, action cameras are designed to be durable, lightweight and easy to carry and easy to mount for hands-free operation. Such features distinguish action cameras from traditional recording devices, smartphones and tablets.

### Global Shipments

Global digital camcorder shipments, which historically comprised shipments for mainly general camcorders and traditional camcorders, declined at a CAGR of -15.3% from approximately 23.2 million units in 2010 to approximately 14.1 million units in 2013. Total shipments saw growth in 2014 as action cameras are driving new growth in both the customer market and enterprise market. According to Frost & Sullivan, the CAGR of global digital camcorder shipments from 2015 to 2019 is projected to reach 9.8% with shipments in 2019 forecasted to reach approximately 26.7 million units.

The following chart illustrates the historical and projected changes in global digital camcorder shipments from 2010 to 2019:



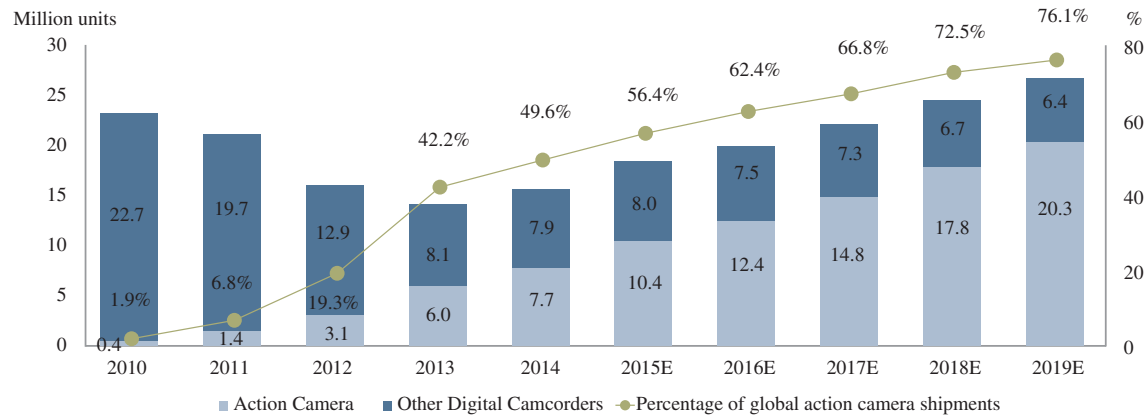
Source: Frost & Sullivan

Action cameras have been gaining in market penetration and have been replacing other digital camcorders since 2009. Due to its improved quality and ease of use compared to other digital camcorders, action cameras are expected to lead the market and drive further growth. According to Frost & Sullivan, action cameras are expected to account for more than 75% of global digital camcorder shipments by 2019.

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The following chart illustrates the historical and projected changes in global shipments of action cameras and other digital camcorders and the percentage of global action camera shipments in global digital camcorder shipments from 2010 to 2019:

**Action Camera vs Other Digital Camcorders Shipments and Forecast (Global), 2010-2019E**



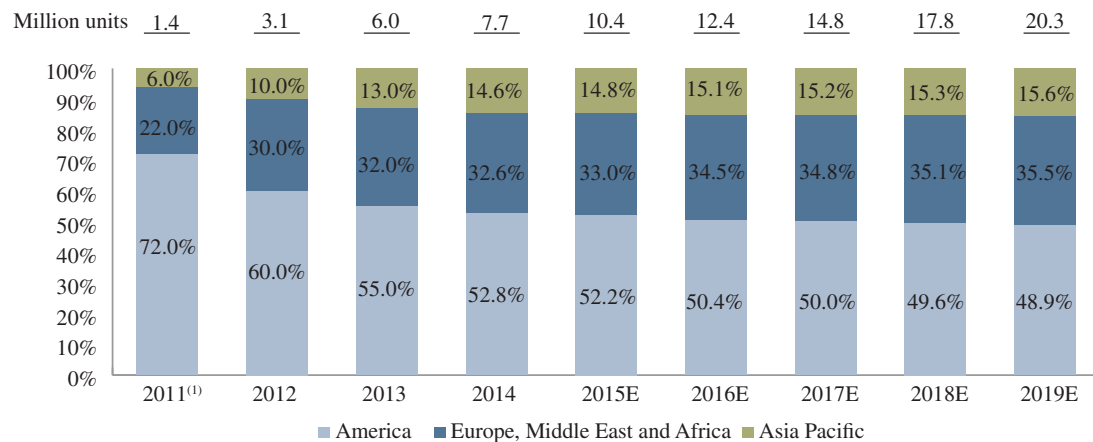
Source: Frost & Sullivan

With the creation of a new market, demand for action cameras saw considerable growth with global shipments increasing at a CAGR of 104.2% from 2010 to 2014 to reach approximately 7.7 million units globally in 2014, according to Frost & Sullivan. Global action camera shipments are expected to continue to grow at a CAGR of 18.3% from 2015 to 2019 with approximately 20.3 million units forecasted to be shipped in 2019.

The majority of global action camera shipments are to the United States. However, with key players expanding to the Asia Pacific market, growth of the regional Asia Pacific market is forecasted to reach a CAGR of 19.4% from 2015 to 2019, according to Frost & Sullivan. Europe, the Middle East and Africa are expected to maintain fast growth with further increases in the adoption rate while the U.S. market will be driven by replacement.

The following chart illustrates the historical and projected changes in the breakdown of global action camera shipments by geography from 2011 to 2019:

**Global Action Camera Shipments by Geography, 2011-2019E**



Source: Frost & Sullivan

Note:

(1) The data for 2010 is not available.

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### Key Drivers for the Action Camera Market

The market size for action cameras globally is expected to continue to grow steadily between 2015 to 2019, according to Frost & Sullivan. The key drivers for the market growth are:

- *Easy-to-carry functionality.* Action cameras can be as small as a matchbox and weigh under 200 grams, making them more convenient to carry than traditional cameras. Despite being small, action cameras do not compromise on functionality and most action cameras on the market can shoot 1080p high-definition video and some are even capable of 4K video. New generations of action cameras often have add-ons that allow for Wi-Fi and other functions which link up the action camera to users' other devices.
- *First-person imaging experiences.* Action cameras are designed to shoot videos with first-person perspectives, which gives viewers a personal perspective into activities such as surfing, rock climbing and skiing.
- *Hands-free operation.* Shooting videos with an action camera is more user friendly than with traditional cameras which require a person to hold and operate the camera, or fix it to a particular camera mount. Action cameras are designed to be operated hands-free and can manage high-definition continuous captures and self-shoots even in fast action situations, which enhances user experience.
- *Surging social networking demand.* Social networking has become indispensable in people's daily life and people tend to share their lives via social media platforms. The development of social media allows people to easily post short videos, which provides motivation for users to create and share engaging videos.

### Key Entry Barriers for the Action Camera Market

Key barriers to entry into the market for action camera brand owners are:

- *Brand loyalty.* The leading brand has created the culture surrounding action cameras and established a large, loyal customer base over the years. New entrants would only be able to break through by either upgrading their hardware or offering a lower price.
- *Value chain barrier.* New entrants face the difficulty of establishing a distribution network, cultivating relationships with quality suppliers and other problems associated with creating a network. It may take several years to fully establish a chain of suppliers and distributors.
- *Cloud service.* Brand owners are increasingly investing in cloud computing to expand the media functions of action cameras by offering cloud services which, in turn, increase the end customers' brand loyalty. This requires additional investment in infrastructure and professional personnel which creates barriers to entry for new entrants.

Key barriers to entry into the market for action camera manufacturers are:

- *Capital investment.* Action cameras are part of the electronic manufacturing industry which requires considerable capital investment in plant and equipment. Equipment used in the manufacturing processes, such as modelling, surface-mounting and testing, are precise instruments which require certain capital investment.
- *Research and development capabilities.* Strong research and development capabilities are required during the manufacturing process, such as moulding, imaging and software and hardware testing. Research and development is also needed to keep pace with new innovations and upgrades in key components such as DSPs and sensors. Software development capabilities also create an entry barrier as products require more sophisticated software applications.
- *Customer relationship.* Existing manufacturers have established stable customer relationships with brand owners in the action cameras industry through years of cooperation. Brand owners in the market are mostly global companies who have a strict partner selection process. New entrants would need to break through an existing relationship before becoming a qualified partner.

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### Raw Materials, Components and Parts

With respect to mid to high-end action cameras priced over US\$250 each, the majority of the cost of raw materials, components and parts is attributable to processors and sensors. The following table illustrates the historical and projected price range of certain components and parts for mid to high-end action cameras from 2012 to 2017:

	2012	2013	2014	2015E	2016E	2017E
			US\$			
Processor	6.0 – 12.0	5.4 – 11.8	6.4 – 12.5	7.0 – 13.0	6.8 – 13.0	6.7 – 13.2
Sensor	5.5 – 10.0	5.0 – 9.7	5.2 – 10.0	5.4 – 10.8	5.3 – 10.6	5.3 – 10.5
Lens	4.0 – 5.0	3.9 – 5.0	3.8 – 5.0	3.8 – 5.0	3.6 – 4.8	3.6 – 4.9

Source: Frost & Sullivan

### COMPETITIVE LANDSCAPE

#### Action Camera Brands

The action camera market has a few major players who account for the majority of the market. According to Frost & Sullivan, in 2014, the top three action camera brands accounted for approximately 80% of the action camera market in terms of shipments.

#### GoPro

GoPro is a NASDAQ-listed U.S. company engaged in developing and selling cameras, in particular for the action sports markets. They launched their first high-definition camera in 2009 and have become a major camera brand in terms of 2014 shipments according to Frost & Sullivan. In 2014, GoPro shipped approximately 5.2 million camera units that were sold together with a combination of a waterproof housing, a battery, selected mounts and other accessories, depending on the model. According to The NPD Group's Retail Tracking Service, GoPro was the number one selling camcorder (by dollars and units) in the United States in 2013 and their cameras represented a 45% share of the U.S. camcorder market (by dollars) in 2013. According to Frost & Sullivan, in 2014, GoPro's camera shipments accounted for approximately 33.3% of global digital camcorder shipments in 2014.

GoPro's revenue increased at a CAGR of 62.8% from US\$526.0 million in 2012 to US\$1,394.2 million in 2014 and its cost of revenue increased at a CAGR of 60.3% from US\$298.5 million in 2012 to US\$767.0 million in 2014. GoPro outsources manufacturing to two principal manufacturers, including our Group, and shipped approximately 2.3 million, 3.8 million and 5.2 million camera units in 2012, 2013 and 2014, respectively. Our shipments of action cameras to GoPro totalled approximately 1.6 million, 1.4 million and 2.2 million units, representing approximately 69%, 37% and 42% of the units shipped by GoPro in the respective years. The decrease in shipments of action cameras from 2012 to 2013 was primarily due to reduced orders from GoPro as they shifted production of certain new models to a different supplier.

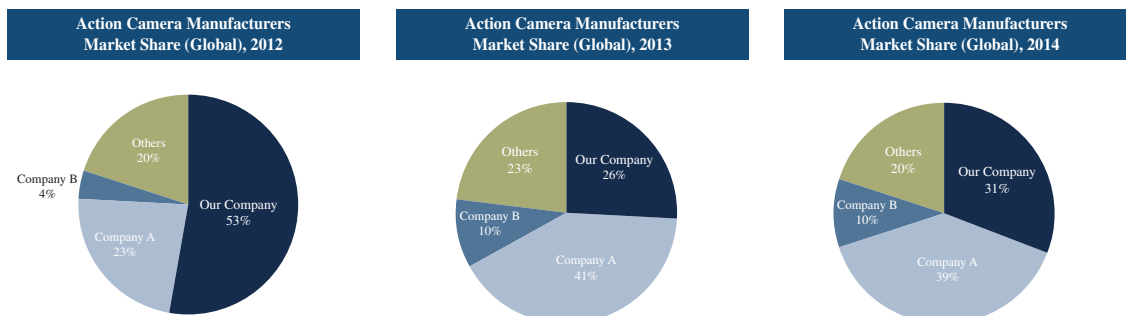
#### Other Major Brands

In recent years, more brand companies, including major established electronics brands, have entered the market. In particular, iON, a U.S.-based action camera company, and Sony have introduced a variety of PoV camcorders. According to Frost & Sullivan, iON and Sony have become two well-established action camera brands with approximately 0.2 million and 0.8 million units of action cameras shipped in 2014. Market competition is likely to increase as more international and regional brands are entering, or are expected to enter, the action camera market.

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### Action Camera Manufacturers

As new brands enter the action camera market, many partner with manufacturers to introduce new products. The following charts show the market share of major action camera manufacturers by global shipments from 2012 to 2014:



The major manufacturers for the action camera industry globally include JDM/ODM manufacturers, such as our Company, and OEM and own brand manufacturers from China, Taiwan and Japan. According to Frost & Sullivan, we ranked second by market share in each of 2013 and 2014 and ranked first in 2012. We also ranked first in terms of aggregate shipments of action cameras from 2010 to 2014 among action camera manufacturers worldwide. The three largest manufacturers together accounted for more than 75% of global action camera shipments in each of 2012, 2013 and 2014.

The following table shows the global shipments of major action camera manufacturers from 2010 to 2014:

	2010	2011	2012	2013	2014	Aggregate 2010 – 2014
	<i>Million units</i>					
Our Company	0.4	1.1	1.6	1.5	2.4	7.1
Company A <sup>(1)</sup>	–	–	0.7	2.4	3.0	6.1
Company B <sup>(2)</sup>	–	–	0.1	0.6	0.8	1.5
Others	–	0.3	0.6	1.4	1.6	3.9
Total	0.4	1.4	3.1	6.0	7.7	18.6

Source: Frost & Sullivan

Notes:

- (1) Company A is a large OEM manufacturer and a leading provider of keyboards, webcams and camera modules for laptops. It has rapidly developed its action camera business since 2012 and is a principal manufacturer for GoPro.
- (2) Company B is an own brand manufacturer and a leading manufacturer of electronic products for the global consumer and professional markets.

### Traditional Digital Cameras

Market demand for traditional digital cameras has been negatively affected by the increased adoption of smartphones in recent years. According to Frost & Sullivan, global digital camera shipments peaked at 138.6 million units in 2010 as brand owners initiated aggressive sales promotions. A significant decline in demand began to be recorded in 2012, with global digital camera shipments decreasing at a CAGR of -24.4% from 2010 to 45.4 million units in 2014, according to Frost & Sullivan. It is expected that users are getting increasingly accustomed to using smartphones to capture images, which will continue to adversely affect the demand for traditional digital cameras.

The traditional digital camera market is relatively consolidated and is largely led by Japanese companies as the largest digital camera brands. According to Frost & Sullivan, Japanese brands captured more than 70% of the global digital camera market in 2014. Most Japanese brands produce their high-end products domestically in Japan and have their medium and low-end products manufactured in China and Taiwan. Taiwanese manufacturers are the largest digital camera manufacturers to which digital camera brands outsource the manufacturing of their products.



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With the declining market trends for traditional digital cameras, both brand owners and manufacturers are seeking growth by expanding their product lines to include a wider array of digital imaging products based on their respective core competency, among other factors.

### THE GLOBAL IP CAMERA MARKET

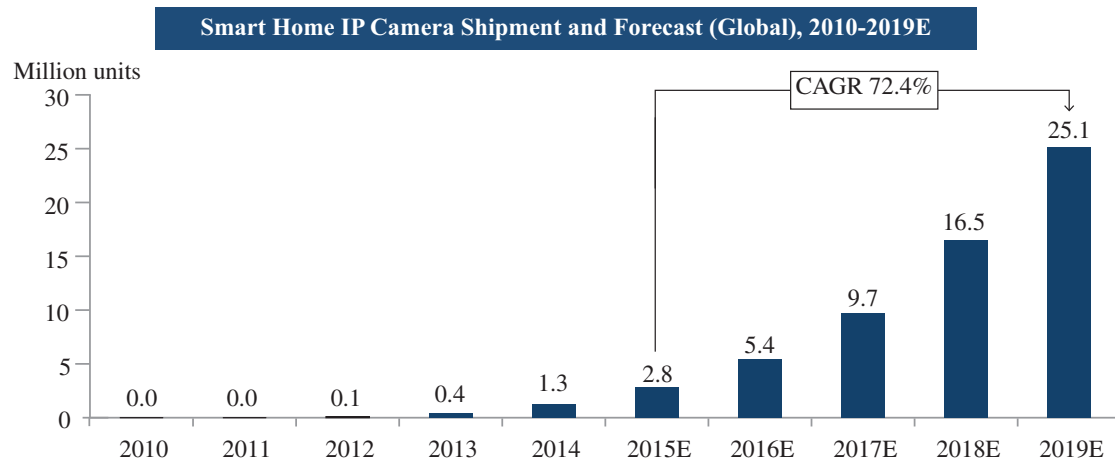
#### Overview

IP cameras are a type of digital video camera which is usually employed for surveillance and can transmit data through a computer network and the internet, without the need to be connected to other devices. These include IP cameras for indoor and outdoor use, and smart home IP cameras and commercial building IP cameras.

#### Global Shipments

Higher definition, better storage and connectivity have contributed to the market growth of IP cameras. In particular, the smart home IP camera market boomed from 2010 to 2014. Users are buying smart home IP cameras for home surveillance, as well as child care and elder care. With higher definition and interaction with smart devices, smart home IP cameras are expected to enjoy strong growth in the near future. According to Frost & Sullivan, global smart home IP camera shipments are projected to grow at a CAGR of 72.4% from 2015 to 2019 with shipments in 2019 forecasted to reach approximately 25.1 million units.

The following chart illustrates the historical and projected changes in global smart home IP camera shipments from 2010 to 2019:



Source: Frost & Sullivan

#### Key Drivers for the Smart Home IP Camera Market

The market size for smart home IP cameras globally is expected to continue to grow between 2015 to 2019, according to Frost & Sullivan. The key drivers for the market growth are:

- **Demand increase.** Consumers are increasingly paying more attention to home surveillance and frequent home monitoring. Smart home IP cameras enable users to directly view and monitor their family and homes which will appeal to safety-conscious consumers.
- **Technology maturity.** Major players in the IP camera industry are investing in smart home IP cameras. Furthermore, related technologies such as signal transmission and data storage are sufficiently mature to support smart home devices.
- **Affordable price.** The cost of components for smart home IP cameras is expected to continue to decrease, thus allowing for potential reduction of the average selling price of smart home IP cameras and making the product more affordable to a wider market.

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### Key Entry Barriers for the Smart Home IP Camera Market

Key barriers to entry into the smart home IP camera market are:

- *Technology requirements.* Manufacturing smart home IP cameras requires extensive technological expertise and research and development capabilities. Moreover, smart home IP cameras require more stability and greater safety measures than those used for general commercial buildings.
- *Channel barrier.* The smart home IP camera market relies heavily on channel operation since the end consumers are generally individuals buying through retailers or e-commerce establishments. Furthermore, equipment maintenance also requires further channelling. As such, entrants need to build a number of key relationships to form the required channels.
- *Talent barrier.* The smart home IP camera industry is knowledge-intensive requiring considerable research and development and design capabilities. New entrants need to cultivate a talent pool that is experienced in a wide range of technical abilities.
- *Algorithm and cloud service.* Smart home IP cameras are increasingly developed to be used as a part of an ecosystem with systematic service. A highly professional algorithms for analysing images will be the foundation of future service, commanding greater programming and infrastructure requirements which would take time to build up. Furthermore, the cloud computing technology will be increasingly deployed for uploading of data.

### THE GLOBAL SMART WEARABLE DEVICE MARKET

#### Overview

Wearable devices are electronic devices that are easily worn on the user's body with smart functions to analyse and share information across devices. Smart wearable devices represent an entirely new product category incorporating sensors and computing on an individual user's body. By interacting with the wearer or other devices, a smart wearable device is used to accomplish certain purposes such as payment, entertainment and health monitoring. Some smart wearable devices focus on athletic performance, allowing users to track their exercise routine, monitor health data and share their experiences on social networks.

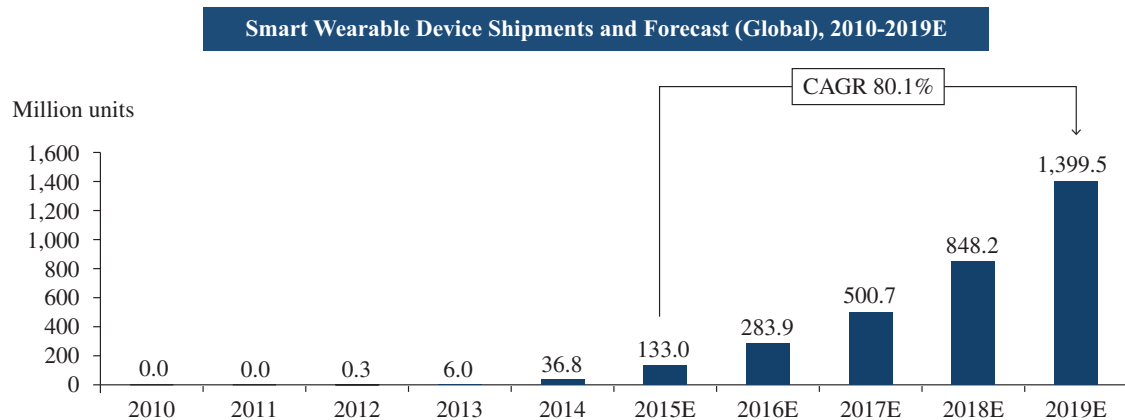
#### Global Shipments

Positioned as the beginning of an even bigger change in behaviour and culture than smartphones and tablets, smart wearable devices are believed to be one of the fastest growing consumer products. According to Frost & Sullivan, global smart wearable device shipments began with approximately 0.3 million units shipped in 2012 and are expected to grow considerably at a CAGR of 80.1% from 2015 to 2019 with approximately 1.4 billion units to be shipped in 2019.



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The following chart illustrates the historical and projected changes in global smart wearable device shipments from 2010 to 2019:



Source: Frost & Sullivan

Since the inception of the smart wearable devices market in 2012 with smart watches and smart glasses, an increasing number of new entrants have broken through with various other kinds of wearable devices such as bands and rings.

### Key Drivers for the Smart Wearable Device Market

The market size for smart wearable devices globally is expected to grow significantly between 2015 to 2019, according to Frost & Sullivan. The key drivers for the market growth are:

- *Capital support.* Smart devices have been a popular investment area for years and smart wearable devices are enjoying increasing capital support as more investors are becoming interested in the industry. Capital from technology companies and investors are flowing into this industry which will drive growth.
- *Increasing demand.* Consumers are paying more attention to health and athletics. The market for smart wearable devices will grow with this trend as it offers consumers a convenient, portable method of tracking their health.
- *Value chain technology maturity.* The smart wearable device value chain comprises a number of technologies, including hardware components, operating systems and software. Hardware components such as chipsets, optical modules and sensors have fully developed with the increasing adoption of smartphones. Similarly, operating systems and software development have been maturing technically to keep pace with smartphone development. As such, these technologies are now sufficiently mature to support the fast-growing progress of other smart devices, such as smart wearable devices.

### Key Entry Barriers for the Smart Wearable Device Market

The key barriers to entry into the smart wearable device market are:

- *Technology barrier.* Smart wearable device manufacturing is more complicated than just the assembly of hardware components. Integration of hardware and software elements and compatibility across devices create an entry barrier. Additionally, software development and rapidly changing trends in technology adoption also create difficulties.
- *Consumer relationship.* The first entrants in the smart wearable device industry will have the advantage of building their own loyal customer base but doing so requires considerable time, money and resources.
- *Algorithm and data service.* Algorithms form the basis for data analysis and thus are essential to smart device vendors. In order to offer data services, new entrants must be able to data mine sufficient information to support their services, such as social networking information or health advice. Entrants also need to build up their data analysis abilities by either establishing an in-house team or partnering with professional agencies who can support data services.